(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 29 September 2005 (29.09.2005)

PCT

(10) International Publication Number WO 2005/090162 A1

(51) International Patent Classification7: B64G 1/64, 1/22

(21) International Application Number:

PCT/IT2004/000638

(22) International Filing Date:

18 November 2004 (18.11.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: RM2004A000153

24 March 2004 (24.03.2004) IT

(71) Applicant (for all designated States except US): FIN-MECCANICA S.P.A. [IT/IT]; P.zza Monte Grappa, 4, IT-00195 Roma (IT).

(72) Inventor; and

(75) Inventor/Applicant (for US only): LICATA, Renato [IT/IT]; Corso Cosenza, 87, I-10137 Torino (IT).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

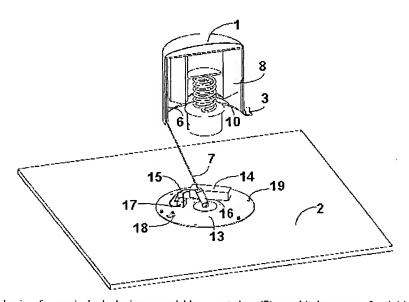
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PASSIVE DEPLOYMENT MECHANISM FOR SPACE TETHERS



(57) Abstract: Mechanism for passively deploying expendable space tethers (7) on orbit, by means of an initial separation impulse only, provided by a simple spring system (10) that is part of the mechanism itself. The passive deployment of the space tether and a tethered end-mass is provided by the particular mechanism devised, having very low deployment friction and resistance. Tether deployment brake towards the final part of deployment is produced by a daisy-like brake (12), stored within the winding of the fixed tether spool so that it is automatically deployed (opened) and starts its deployment braking or resistance function from a planned point of the tether deployment in space.

INTERNATIONAL SEARCH REPORT

Internation pplication No
PCT/IT2004/000638

A. CLA	ASSIFIC	O NOITA	F SUB	JECT	MATTER	
IPC	7	B64G1	/64		MATTER B64G	1/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 $\begin{array}{ccc} {\rm Minimum\ documentation\ searched\ (classification\ system\ followed\ by\ classification\ symbols)} \\ {\rm IPC\ 7\ B646\ B65H} \\ \end{array}$

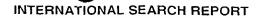
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, COMPENDEX, INSPEC-

C. DOCUM	ENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CARROLL J A: "SEDS Deployer Design and Flight Performance" AIAA PAPER, 'Online! no. 93-4764, 1993, XP002322656 Retrieved from the Internet: URL:http://www.tetherapplications.com/papers/aiaa93-4764.pdf> 'retrieved on 2005-02-18! cited in the application page 2, column 1, paragraph 1 - column 2, paragraph 2; figure 2	1,3
A	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 08, 6 October 2000 (2000-10-06) & JP 2000 128097 A (MITSUBISHI HEAVY IND LTD), 9 May 2000 (2000-05-09) abstract	1,3

Further documents are listed in the continuation of box C.	χ Patent family members are listed in annex.
Special categories of cited documents: 'A' document defining the general state of the art which is not considered to be of particular relevance 'E' earlier document but published on or after the International filling date 'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) 'O' document referring to an oral disclosure, use, exhibition or other means 'P' document published prior to the international filling date but later than the priority date claimed	 'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention. 'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone. 'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. '&' document member of the same patent family
Date of the actual completion of the international search 30 March 2005	Date of mailing of the international search report 13/04/2005
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nt, Fax: (+31-70) 340-3016	Authorized officer Calvo De No, R





	Patent document cited in search report		Publication date	Patent family member(s)		Publication date
	JP 2000128097	Α	09-05-2000	NONE		
	JP 04159199	A	02-06-1992	NONE		
	US 4083520	Α	11-04-1978	NONE	· —— · · · · · · · · · · · · · · · · ·	
1						

Form PCT/ISA/210 (patent family annex) (January 2004)